



(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:  
**24.12.2014 Bulletin 2014/52**

(51) Int Cl.:  
**C12P 13/00 (2006.01)**  
**C12N 9/10 (2006.01)**  
**C12N 9/88 (2006.01)**

(43) Date of publication A2:  
**09.10.2013 Bulletin 2013/41**

(21) Application number: **13305442.9**

(22) Date of filing: **05.04.2013**

(84) Designated Contracting States:  
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR**  
Designated Extension States:  
**BA ME**

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(30) Priority: **06.04.2012 US 201261621404 P**

(54) **Process for producing 5-aminopentanoate employing a recombinant microorganism**

(57) The present invention concerns a method for the biological preparation of 5-aminopentanoate comprising culturing a microorganism genetically modified for

the bioproduction of 5-aminopentanoate, wherein the microorganism comprises a metabolic pathway for conversion of lysine or 2-oxoadipate into 5-aminopentanoate.

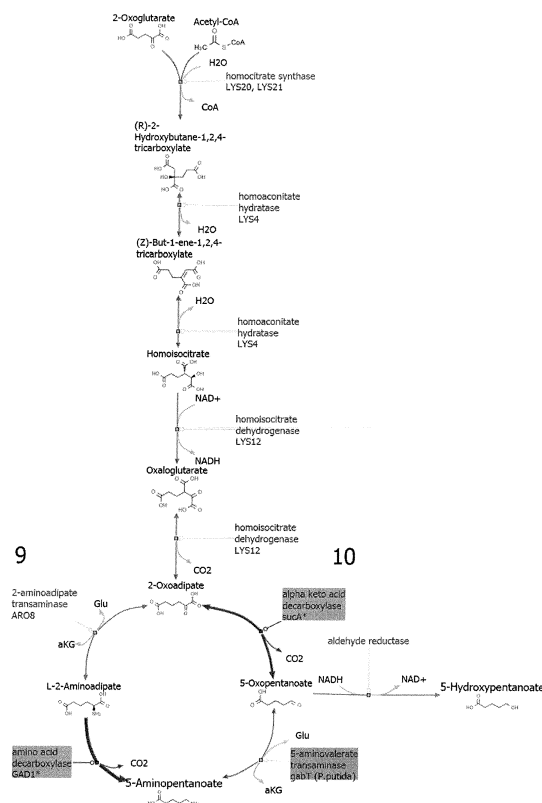


Figure 2



## EUROPEAN SEARCH REPORT

 Application Number  
 EP 13 30 5442

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 2010/068944 A2 (CELEXION, LLC) 17 June 2010 (2010-06-17) * page 24, line 18 - line 23 * * page 27, line 30 - page 28, line 1 * * page 28, paragraph 66 * * page 52 - page 60; claims 1-6, 41-43, 53, 54, 60, 82 * * figure 2 * * enzymatic steps: II, 8 * -----	1-5,11, 12	INV. C12P13/00 C12N9/10 C12N9/88
X	WO 2011/031147 A1 (DSM IP ASSETS B.V.) 17 March 2011 (2011-03-17) * page 2, line 33 - page 4, line 1 * * page 4, line 27 - line 33 * * page 9, line 10 - page 11, line 29 * * page 11, line 34 - page 13, line 22 * * page 14, line 34 - page 15, line 24 * * page 15, line 34 - page 16, line 26 * * page 17, line 8 - page 18, line 1 * * page 19, line 24 - page 21, line 12 * * page 21, line 34 - page 22, line 22 * * page 29, line 31 - page 36, line 35 * * page 37, line 35 - page 39, line 26 * * page 59 - page 63; example III * * page 250 - page 253; claims 1-12, 14, 15 * -----	1-5,11, 12	TECHNICAL FIELDS SEARCHED (IPC) C12P C12N
A	----- DATABASE GenBank [Online] 12 June 2006 (2006-06-12), IRAQUI, I. ET AL.: "aromatic amino acid aminotransferase I [Saccharomyces cerevisiae]", XP002726393, retrieved from NCBI Database accession no. CAA73946 * the whole document * ----- -/--	1-5,11, 12	
1 <del>The present search report has been drawn up for all claims</del>			
Place of search		Date of completion of the search	Examiner
Berlin		30 June 2014	Fuchs, Ulrike
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03.82 (P04C01)



## EUROPEAN SEARCH REPORT

Application Number  
EP 13 30 5442

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A,D	WO 2010/068953 A2 (METABOLIX INC.) 17 June 2010 (2010-06-17) * page 8, line 4 - line 23 * * page 74 - page 78; claims 1-6, 36 * * figures 2, 3 * -----	1-5,11,12	
			TECHNICAL FIELDS SEARCHED (IPC)
<del>The present search report has been drawn up for all claims</del>			
Place of search		Date of completion of the search	Examiner
Berlin		30 June 2014	Fuchs, Ulrike
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03.82 (P04C01)



Application Number

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**CLAIMS INCURRING FEES**

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

**LACK OF UNITY OF INVENTION**

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☒ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

3-5(completely); 1, 2, 11, 12(partially)

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).



# **LACK OF UNITY OF INVENTION** **SHEET B**

Application Number

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The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

## 1. claims: 3-5(completely); 1, 2, 11, 12(partially)

process for the fermentative production of 5-aminopentanoate from lysine or one precursor of lysine comprising culturing a recombinant microorganism in a culture medium comprising a source of carbon and nitrogen, wherein in said microorganism the 5-aminopentanoate biosynthesis pathway is composed of: the initial substrate 2-oxoadipate is converted into 5-aminopentanoate by the successive actions of an amino acid transaminase and an amino acid decarboxylase (pathway no. 9);

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## 2. claims: 6-8(completely); 1, 2, 11, 12(partially)

process for the fermentative production of 5-aminopentanoate from lysine or one precursor of lysine comprising culturing a recombinant microorganism in a culture medium comprising a source of carbon and nitrogen, wherein in said microorganism the 5-aminopentanoate biosynthesis pathway is composed of: the initial substrate 2-oxoadipate is converted into 5-aminopentanoate by the successive actions of an alpha keto acid decarboxylase and a transaminase (pathway no. 10);

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## 3. claims: 9(completely); 1, 2, 11, 12(partially)

process for the fermentative production of 5-aminopentanoate from lysine or one precursor of lysine comprising culturing a recombinant microorganism in a culture medium comprising a source of carbon and nitrogen, wherein in said microorganism the 5-aminopentanoate biosynthesis pathway is composed of: idem as subject 1, wherein: the initial substrate lysine is converted into 5-aminopentanoate by the successive actions of a transaminase, a keto acid coA ligase and a thioesterase (pathways nos 5, 6, 7);

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## 4. claims: 10(completely); 1, 2, 11, 12(partially)

process for the fermentative production of 5-aminopentanoate from lysine or one precursor of lysine comprising culturing a recombinant microorganism in a culture medium comprising a source of carbon and nitrogen, wherein in said microorganism the 5-aminopentanoate biosynthesis pathway is composed of: the initial substrate lysine is converted into 5-aminopentanoate by the successive actions of at least a transferase, a N6-acetyl-beta-lysine-transaminase and a 4-acetamidobutyrate deacetylase (pathway no. 4);

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**LACK OF UNITY OF INVENTION  
SHEET B**

Application Number  
EP 13 30 5442

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

5. claim: 13

genetically modified microorganism for the fermentative  
production of 5-aminopentanoate as defined in anyone of  
claims 1-11.

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**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 13 30 5442

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
The members are as contained in the European Patent Office EDP file on  
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

30-06-2014

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